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Ontario Energy Board



IN THE MATTER OF THE
ONTARIO ENERGY BOARD ACT

AND

IN THE MATTER OF APPLICATIONS BY

UNION GAS LIMITED

FOR AUTHORITY TO INJECT GAS INTO,
STORE GAS IN, AND REMOVE GAS FROM THE DOW
SARNIA BLOCK "A" POOL AND FOR LEAVE TO
CONSTRUCT NATURAL GAS PIPELINES

E.B.O. 172
E.B.L.O. 239

DECISION WITH REASONS

OCTOBER 29, 1991

Pour des renseignements en français, veuillez communiquer
avec la Commission de l'énergie de l'Ontario.

2300, rue Yonge

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(La Commission accepte les appels
à frais virés.)

Ontario Energy Board



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E.B.O. 172
E.B.L.O. 239

IN THE MATTER OF the Ontario Energy Board Act,
R.S.O. 1980, Chapter 332, as amended, and in particular
Sections 21, 46 and 48 thereof;

AND IN THE MATTER OF an Application by Union
Gas Limited for authority to inject gas into, store gas in
and remove gas from the area known as the Dow Sarnia
Block "A" Pool, in the Corporation of the City of Sarnia-
Clearwater and the Corporation of the Township of
Moore, all in the County of Lambton, and to enter into
and upon the land in the said area and use the said land
for such purposes;

AND IN THE MATTER OF an Application by Union
Gas Limited for an Order granting leave to construct
natural gas pipelines in the Corporation of the City of
Sarnia-Clearwater and in the Corporation of the
Township of Moore, all in the County of Lambton.

BEFORE: C.A. Wolf Jr.
Presiding Member

P.W. Chapple
Member

DECISION WITH REASONS

October 29, 1991

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1. THE APPLICATIONS

1.1 THE APPLICATIONS

1.1.1 By an Application dated May 14, 1991, Union Gas Limited ("Union", "the Company" or "the Applicant") applied to the Ontario Energy Board ("the Board"), pursuant to Section 21(1) of the Ontario Energy Board Act ("the Act"), for an Order authorizing the Company to inject gas into, store gas in, and remove gas from a proposed gas storage area known as the Dow Sarnia Block "A" Pool ("the pool" or "the Dow "A" Pool"), located in Lots 7 and 8, Block "A", Plan 13, and Lots 16 and 17 Concession II, in the Corporation of the City of Sarnia-Clearwater, and Lots 9 and 10, Block "A", Plan 13 and Lots 16 and 17, Concession I, in the Corporation of the Township of Moore, all in the County of Lambton, and to enter into and upon said area and to use said lands for such purposes, ("the E.B.O. 172 Application").

1.1.2 On that same date Union also applied to the Board, pursuant to Sections 46 and 48 of the Act, for an Order or Orders granting leave to construct:

- 0.458 km of NPS 12, 0.277 km of NPS 6 and 0.013 km of NPS 4 gas storage gathering pipelines in Lot 8, Block A, Plan 13, Concession II, in the Corporation of the City of Sarnia-Clearwater and in Lot 9, Block A, Plan 13, Concession I in the Corporation

of the Township of Moore, all in the County of Lambton ("the gathering lines");

- 4.4 km of NPS 16 transmission pipeline from Union's existing Petrosar Station located in Lot 26 Concession VIII to a proposed valve site ("the Dow valve site") in Lot 26 Concession XII, all in the Corporation of the Township of Moore in the County of Lambton ("the SIL loop"); and
- Compression and measurement facilities to be located in Lot 9, Block A, Plan 13, Concession I in the Corporation of the Township of Moore, in the County of Lambton.

1.2 THE COMPANION APPLICATION AND REFERENCE

1.2.1 Concurrent with the filing of the E.B.O. 172 and E.B.L.O. 239 Applications, the Company filed an Application under Section 35 of the Act, for designation of certain lands overlaying the Dow "A" Pool as a natural gas storage area, and for a Regulation to that effect. This matter was also assigned Board File No. E.B.O. 172. On October 18, 1991 the Board issued its Report to the Lieutenant Governor in Council in this matter wherein the Board recommended, subject to revised metes and bounds and other conditions, designation and the enactment of a Regulation.

1.2.2 On March 20, 1991 Union applied to the Minister of Natural Resources ("the Minister") for Permits to Drill four injection/withdrawal wells within the proposed designated storage area of the Dow "A" Pool. The Minister, pursuant to Section 23(1) of the Act, by means of a letter dated June 4, 1991, referred this matter to the Board for a hearing. The Board assigned File No. E.B.R.M. 101 to this matter and on October 25, 1991, issued its Report to the Minister recommending the issuance of the requested

permits, subject to the lands overlaying the Dow "A" Pool being designated as a gas storage area.

- 1.2.3 Neither the Lieutenant Governor in Council nor the Minister have, as yet, acted upon the Board's recommendations.

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2. **THE HEARING**

2.0.1 As required under Sections 23(1), 35(2) and 48 of the Act, following the issuance of the required notices, the Board heard evidence related to each of the above Applications and the Reference on September 4, 5 and 6, 1991 in Sarnia, Ontario. Oral argument by the Company and Board Staff was heard on September 6.

2.0.2 The following parties appeared at the hearing:

Douglas Sulman
Ross Valdis

For Union

Jennifer Lea

For Board Staff

Robert Spence

For Tecumseh Gas Storage
Limited ("Tecumseh")

2.0.3 The Company called the following employees as witnesses:

James Gordon Egden

Manager of Geology

William Charles Fay

Manager of Storage Planning

Larry Ross Hyatt

Manager, Transmission
Planning

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John P. Hayes	Manager of Reservoir Services
Richard Chan	Intermediate Pipeline Engineer
Tony Vadjla	Senior Environmental Planner
Bradley William French	Coordinator of Storage and Natural Gas Leases
David Robert Lowe	Manager of Storage Developments
Don William Hanbridge	Manager of Forecasts and Budgets
Fred Assaf Hassan	Manager of Gas Supply Logistics

- 2.0.4 Union also called D.J. Coleman Ph.D., Manager, Environmental Planning and Services Division, Gore and Storrie Limited.
- 2.0.5 Board Staff called Robert Trevail, Partner, TK Petroleum Consultants Inc.
- 2.0.6 In response to a request by Board Staff, Tecumseh called Francis James Tricker, General Manager, Tecumseh.
- 2.0.7 A complete transcript of the proceedings, together with all exhibits is available for public inspection at the Board's offices in Toronto.
- 2.0.8 Although the Board has considered all the evidence and submissions presented at the hearing, this Decision with Reasons summarizes only those portions which the Board has considered necessary to support the findings contained herein.

3. **BACKGROUND**

3.0.1 The Dow "A" Pool is located, for the most part, in lands owned by Dow Chemical Canada Inc. ("Dow Chemical"). The pool originally contained 109,592 10^3m^3 of gas. Once fully developed to a pressure gradient of 15.8 kPa/m, the pool is projected to provide 174,000 10^3m^3 of storage working capacity. Union claims it requires this additional storage capacity in order to serve the increased demands of its in-franchise customers.

3.0.2 Dow Chemical and Union have entered into an agreement dated March 18, 1991 ("the Agreement") forming a Joint Venture ("the Joint Venture") for the purpose of developing the pool. Under the Agreement Union will develop and operate the storage pool. Dow Chemical's contribution to the Joint Venture, directly or through Union, consists of its assets which are necessary for the development and operation of the pool. Beyond the gas storage rights for the lands involved, and the gas in place, these assets include a 10 inch pipeline from the proposed storage pool to the transfer meter at Dow Chemical's Sarnia plant, and all its existing wells in the pool.

3.0.3 Union, among other things, will be responsible for the installation of specified additional pipelines and other facilities needed to develop and operate the pool.

- 3.0.4 Under the Agreement, each party retains ownership of its pledged assets and holds an interest in the Joint Venture proportional to its respective investment in the pool. Initially each party will hold a 50 percent interest in the Joint Venture.
- 3.0.5 The two parties' share of the operating revenues generated by the Joint Venture will be in proportion to their asset contributions and interests. The Joint Venture will, pursuant to the Act, be subject to the Board's regulation of the rates to be charged for storage services.
- 3.0.6 The term of the Agreement is for 40 years, with provisions for early termination, or renegotiation at the end of that period.
- 3.0.7 The Agreement gives Dow Chemical the right to utilize 50 percent of the working capacity of the Dow "A" Pool for its own purposes.
- 3.0.8 The Agreement also assures Dow Chemical transportation rights on the Joint Venture's pipeline in the event that Dow Chemical installs facilities to directly link its Sarnia plant to the TransCanada PipeLine Limited transmission pipeline, thereby "bypassing" Union's distribution/transmission system.
- 3.0.9 Union, as the designated operator of the pool under the Agreement, is to be responsible for obtaining the regulatory and governmental approvals necessary for the development and operation of the pool.
- 3.0.10 A map showing the location of the proposed storage area for designation, and the proposed facilities for construction, is attached as Appendix "A".

4. AUTHORIZATION TO INJECT, STORE AND WITHDRAW GAS -
E.B.O. 172

- 4.0.1 The Company's competence and expertise in developing and operating a gas storage reservoir were not challenged in this proceeding.
- 4.0.2 Union stated that it estimated the total potential capacity of the pool to be 210,500 10^3m^3 at a planned maximum operating pressure of 10,310 kPaa. With a planned cushion volume of 36,500 10^3m^3 , the potential working capacity of the pool, at 2,100 kPaa, was claimed by Union to be 174,000 10^3m^3 .
- 4.0.3 Union's evidence was that, once the proposed four additional injection/withdrawal wells and compression facilities are in place, the deliverability of the pool, at the beginning of the storage withdrawal season, when the pool is full, will be 5,100 10^3m^3 per day. As withdrawals continue in a "base pool" operating regime, Union expects that deliverability will decrease to 1,983 10^3m^3 per day when 20 percent of the working capacity is in storage, on Union's March 1 design day.
- 4.0.4 Based on its absolute open flow evaluations, and modified isochronal testing, Union characterized the Dow "A" Pool as having average, to below average, deliverability relative to the Company's other storage pools in its system. Union estimated that only four of the 13 existing storage pools

had deliverabilities below what is expected from the Dow "A" Pool. This, according to Union, was due largely to the differences in permeability and porosity between the formations.

- 4.0.5 Board Staff argued that it would not be in the public interest to grant the E.B.O. 172 Application for authorization to inject, store and withdraw gas in and from the Dow "A" Pool, on the basis that Union could increase the deliverability of the Dow "A" Pool and employ the reservoir as a "peaking pool". This, Board Staff claimed, would be a more efficient use of a valuable natural resource, and would maximize the benefit to the public interest.
- 4.0.6 Board Staff, in argument, referenced the testimony of Mr. Tricker wherein he allowed that the deliverability of the Dow "A" Pool could be increased to 4, 532 10^3m^3 per day assuming 20 percent of the volume would remain in the pool on the design day.
- 4.0.7 Mr. Tricker also testified that, to achieve this higher deliverability, additional wells and higher compression would be needed.
- 4.0.8 Mr. Tricker further stated that an earlier proposal by Tecumseh, which was withdrawn prior to the hearing, called for operating the Dow "A" Pool as a peaking pool at a deliverability level above that which is proposed by Union. That proposal was, however, according to Mr. Tricker, tailored to fit Tecumseh's system and was possible due to the proximity of the pool to Tecumseh's compressor station. Mr. Tricker allowed that using the pool as a peak load pool might not provide increased operational flexibility to Union because of its integrated system.
- 4.0.9 Union's evidence was that, should it require additional peak day deliverability, it would be more efficient to operate another of its more suitable storage reservoirs as a peak load pool in preference to employing the Dow "A" Pool for that purpose.

- 4.0.10 Union also stated that, given its integrated storage system, it would not be more efficient to use the Dow "A" Pool as a peak load pool in that this would require carrying higher gas inventories in the pool through the winter heating season.
- 4.0.11 Union's evidence was that it intended to delta pressure the Dow "A" Pool to a pressure gradient of 15.8 kPa/m which is consistent with the maximum operating pressure gradient in its other storage pools in the region. Board Staff tacitly agreed to the delta pressuring of the pool up to the level proposed by Union.
- 4.0.12 Union's witness, Mr. Egden stated that the Dow "A" reef is oriented in a south-west/north-east direction, and that Union had initially intended to include an A1 Carbonate observation well on the north-east flank of the pool, but that this had been deferred until the pool was developed and operating experience had been obtained.
- 4.0.13 Mr. Egden also testified: "I don't anticipate a lot of anomalous behaviour in the A1 Carbonate to the north-east (of the Dow "A" Pool), but I would not be truthful if I didn't say it was of some concern at this point".

4.1 CONDITIONS OF APPROVAL

- 4.1.1 Board Staff proposed four Conditions of Approval with regard to the E.B.O. 172 Application. The first of these was to the effect that Union provide an annual assessment of any gas that might have been lost from the Dow "A" Pool. Union suggested that the Condition be re-worded to acknowledge that it requires more than one year to establish that gas has been lost and, therefore, that any such losses could not be reported annually. The Company also stated that, in any event, such losses would be highlighted as "unaccounted for" gas loss in rates hearings.

4.1.2 Board Staff also proposed the following as a Condition of Approval:

"Union shall obtain from the Ministry of the Environment, a Certificate of Approval in accordance with Section 8 of the Environmental Protection Act, R.S.O. 1980, c.141, regarding the emission of contaminants into the natural environment. A copy of the Certificate of Approval shall be filed with the Board prior to any injection of gas into the Pool."

4.1.3 Union noted that Board Staff's precedent for this Condition was the Board's E.B.O. 167 Decision which imposed said Condition on Centra Gas Utilities Ontario Ltd ("Centra"). Union argued that at the time of the E.B.O. 172 hearing Centra was embarking on its first venture into gas storage operations. Union maintained that the Condition proposed by Board Staff was inappropriate with regard to an experienced gas storage operator with Union's established track record.

5. THE BOARD'S E.B.O. 172 FINDINGS

- 5.0.1 The Board, having concurrently heard all the evidence related to the development of the Dow "A" Pool, finds that it is now in a position to render its Decision on the E.B.O. 172 and E.B.R.O. 239 Applications. The Board cautions the Applicant that the early issuance of this Decision cannot and will not fetter the Lieutenant Governor in Council's or the Minister's decisions in the related matters. The Board further cautions the Applicant that Union will be at risk should it make commitments prior to the issuance of the required Regulation and Drilling Permits.
- 5.0.2 The Board accepts the Applicant's evidence that its proposals for the operation of the Dow "A" Pool are appropriate and in the public interest. In doing so the Board has considered the role that the Dow "A" Pool is proposed to play as part of Union's integrated storage system, as opposed to considerations of the pool in isolation, or as part of a third party's system.
- 5.0.3 The Board agrees that delta pressuring the Dow "A" Pool to a maximum pressure gradient of 15.8 kPa/m would be appropriate and in the public interest.
- 5.0.4 However, the Board, in recognition of the concerns expressed with regard to the uncertain circumstances in the region to the north-east of the pool,

and in an effort to assure the protection of the pool, directs that Union shall, prior to delta pressuring the Dow "A" Pool, apply for a Drilling Permit and install an observation well at an appropriate location in the A1 Carbonate zone to the north-east of the reef, or set out in writing to the Board Secretary why such a well is not required.

5.0.5 The Board agrees with the Applicant, and finds that Union's established record and experience dictates that any failure to comply with Section 8 of the Environmental Protection Act should be dealt with as a violation under that Act, rather than as a Condition when approving the E.B.O. 172 Application.

5.0.6 The Board concurs with the Applicant's position that unaccounted for gas losses from the Dow "A" Pool will require assessments beyond an annual evaluation, and that such losses, if they occur, will be properly dealt with as part of future rates cases.

5.0.7 The Board agrees that the remaining Conditions of Approval submitted by Board Staff, and agreed to by the Applicant, are appropriate for imposition when granting the E.B.O. 172 Application.

5.0.8 The Board therefore authorizes Union to inject, store and withdraw gas in the Dow "A" Pool, to enter into and upon said area, and to use said lands for such purposes, conditioned upon the following:

- the enactment of the required Regulation by the Lieutenant Governor in Council designating the Dow "A" Pool as a gas storage area;
- the issuance of the applied-for four Drilling Permits by the Minister; and
- the Applicant's adherence to the Conditions of Approval attached as Appendix "B".

6. LEAVE TO CONSTRUCT - E.B.L.O. 239

6.0.1 Union claimed that the gathering lines, i.e. those lines upstream of the compressor station, would be in a Class 1 location and that they would be accordingly constructed to a 0.72 design factor. The maximum allowable operating pressure in these lines, according to Union, will be 10,690 kPag.

6.0.2 The SIL loop, which the Company claimed is required to increase the capacity of the existing Samia Industrial Line would, by its estimate, be in a Class 2 location. Union stated that the maximum allowable pressure in the SIL loop will be 6,620 kPag, and that it will be installed to meet a 0.5 design factor.

6.1 NEED

6.1.1 All parties concurred that Union requires the additional 174,000 10^3m^3 of working storage capacity that will ultimately be provided by the Dow "A" Pool in order to meet the in-franchise needs of its customers.

6.1.2 Union stated that the gathering lines, the SIL loop and the added compression and associated facilities are required in order to transport and monitor the stored gas, and to generate the pressures required for the effective injection and withdrawal of gas into and out of the Dow "A" Pool.

- 6.1.3 Board Staff agreed that, providing the Board sees fit to grant the Company the authority to inject, store and withdraw gas as applied for in the E.B.O. 172 Application, the proposed facilities will be required.

6.2 ECONOMICS

- 6.2.1 Union's evidence was that the total cost of developing the Dow "A" Pool would be \$32,103,000. Of this, \$517,000 would be for the construction of the gathering lines, and \$2,601,000 would be required to construct the SIL loop. These costs include contingencies, interest during construction and general overheads.

- 6.2.2 The capital cost for installing a 2,650 horsepower compression station and the associated measurement and dehydration facilities was estimated by the Applicant to be \$8,067,000. This estimate again included interest during construction and general overheads, plus plant items.

- 6.2.3 Board Staff concurred that the Company's construction cost estimates were reasonable, but argued that the apportionment of the costs between the Joint Venture and Union might not be appropriate. Board Staff and the Applicant agreed that this matter would be the subject of future hearings when the Board deals with the matters of the rate bases for Union and the Joint Venture.

- 6.2.4 The Applicant evaluated the economic feasibility of the total proposed project in accordance with the Three Stage Test methodology described in the Board's E.B.O. 134 Report. When doing so, the Company employed its incremental weighted average cost of capital over a 30 year period.

- 6.2.5 The Company's evidence showed that, if the benefits of developing and operating the Dow "A" Pool were ascribed to its in-franchise customers, as it proposes, a Profitability Index ("PI") of 3.96 would be realized for the total project. Should the benefits be apportioned with 55 percent allocated

to in-franchise customers and 45 percent to Union's M-12 Transportation Service customers, the PI would reduce to 2.22, according to the Company.

6.2.6 Board Staff proposed that Dow Chemical might exercise its right under the Agreement to require 50 percent of the working capacity of the pool for its own uses. The Company calculated that in such an event a PI of 1.75 would result.

6.2.7 Board Staff challenged that the Company had overstated several of the cost avoidance assumptions that it employed in its analyses. However, since the calculated PIs were well above one, and therefore reflected economic sufficiency, Board Staff accepted that the project, in total, is economically sound.

6.3 ENVIRONMENTAL AND LANDOWNER/TENANT CONCERNS

6.3.1 The proposed facilities are to be constructed on lands owned by Ontario Hydro and Dow Chemical. The SIL loop will be located on a permanent easement to be obtained from Ontario Hydro.

6.3.2 The Company's easement agreement with Ontario Hydro will be in a form previously approved by the Board.

6.3.3 Currently, tenant farmers utilize affected lands owned by Dow Chemical, within the proposed boundaries of the Dow "A" Pool. The Company stated that, since the gathering lines within the pool area will largely follow an existing access road and an existing pipeline route, the construction of the gathering lines will result in only minimal disruption to agricultural lands.

6.3.4 The Company stated that it had considered several alternatives to the proposed project, but that none of these yielded economic or security of

supply benefits to match those that are claimed to result from the proposed development and operation of the pool.

- 6.3.5 The Company filed an independent Route Selection/Environmental Assessment Report for the NPS 16 SIL loop which had been prepared, at its request, by Gore & Storrie Limited. This report concluded that only minimal environmental disruption would result from the proposed project, and that suggested mitigation measures could effectively redress any environmental damages that might occur. Union committed to employ the construction procedures and mitigation measures defined in the report.
- 6.3.6 It was noted in the hearing that tenant landowners reside as close as 400 metres to the proposed location of the new compressor station. These tenants would, therefore, be subjected to the noise emitted when operating the station, including the noise associated with occasional blow-downs.
- 6.3.7 Union stated that it is currently involved in a study of the measures that can be employed to further abate the noise that is attendant to the operation of compressor stations. The Company was confident that its education and mitigation programs would alleviate concerns over noise pollution.
- 6.3.8 Board Staff concluded that, if the Conditions of Approval which it proposed are accepted, the problem of noise pollution could be satisfactorily managed. Union agreed to be bound by the imposition of Board Staff's proposed condition which is specific to the issue of noise abatement.
- 6.3.9 Union stated that it would not differentiate between landowners and tenants when dealing with matters such as the restoration of agricultural lands or compensation for crop losses, but that it would need to involve Dow Chemical, as the landowner, when dealing with tenant farmers.

6.4 CONDITIONS OF APPROVAL

6.4.1 Board Staff submitted a series of Conditions of Approval which it proposed should be imposed if the Board grants the E.B.L.O. 239 Application. These proposed conditions were, in substance, accepted by the Applicant.

6.4.2 Union also accepted that it would be bound by the Conditions of Approval, relative to improved communications with landowners, which the Board had imposed in its recent E.B.L.O. 234 Decisions.

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7. THE BOARD'S E.B.L.O. 239 FINDINGS

- 7.0.1 The Board notes that, pending the Board's authorization to inject, store and withdraw gas from the pool, and conditioned on the imposition of Board Staff's proposed Conditions of Approval, Board Staff supported granting the E.B.L.O. 239 Application.
- 7.0.2 The Board finds that the Applicant has satisfactorily demonstrated the need for the proposed facilities and that the construction of said facilities is economically feasible.
- 7.0.3 The Board further finds that the expected degree of environmental disruption that will accompany the construction of the proposed facilities is acceptable, providing that the Company's committed mitigation measures are applied.
- 7.0.4 The Board has reviewed the Conditions of Approval that were agreed to by the parties. The Board finds that these Conditions are, in substance, appropriate for imposition when granting leave to construct in this case.
- 7.0.5 The Board is concerned that the advances that have been made, with regard to Union's construction practices and procedures, should not be allowed to erode. The Board, therefore, feels it appropriate that the Conditions of Approval to be imposed in this case be consistent with the

pertinent Conditions of Approval which Union has accepted in previous leave to construct proceedings. The Board has thus modified and expanded the Conditions of Approval agreed to by the Company in this hearing without significantly changing their substance.

- 7.0.6 The Board finds that the Conditions of Approval contained in Appendix "C" shall be imposed on the Applicant.
- 7.0.7 Conditioned on the enactment of a Regulation by the Lieutenant Governor in Council establishing the Dow Sarnia Block "A" Pool as a natural gas storage area, and, the Minister of Natural Resources issuing Drilling Permits for the Union Dow Sarnia No. 1, Union Dow Sarnia No. 2, Union Dow Sarnia No. 4 and Dow Sarnia No. 5 injection/withdrawal wells within the Dow Sarnia Block "A" Pool, and further subject to compliance with the Conditions of Approval set forth in Appendix "C", the Board finds the construction of the proposed facilities to be in the public interest, and hereby approves the E.B.L.O. 239 Application for leave to construct the applied-for facilities.
- 7.0.8 The Board finds that the Company's easement agreement with Ontario Hydro relative to the proposed facilities will be in the form previously approved by the Board.
- 7.0.9 The Board makes no finding with regard to the allocation of the costs and benefits of the proposed project between Union and the Joint Venture. The Board anticipates that these matters will be dealt with in subsequent hearings dealing with the allowed rate bases for Union and the Joint Venture.
- 7.0.10 In like manner the Board makes no finding at this time with regard to the appropriateness of the structure of the Joint Venture or the Agreement which underlies it. These matters will likely be addressed as part of

DECISION WITH REASONS

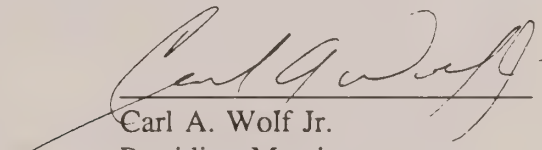
Union's next rates case and when the Joint Venture applies to the Board for the approval or fixing of rates to be charged for its storage services.

DECISION WITH REASONS


8. COSTS

- 8.0.1 No party to these proceedings applied for an award of costs pursuant to Section 28 of the Act.
- 8.0.2 The Board finds that Union shall pay the Board's costs of, and incidental to, these proceedings forthwith upon receipt of the Board's Cost Order and invoices.

DATED AT Toronto October 29, 1991.



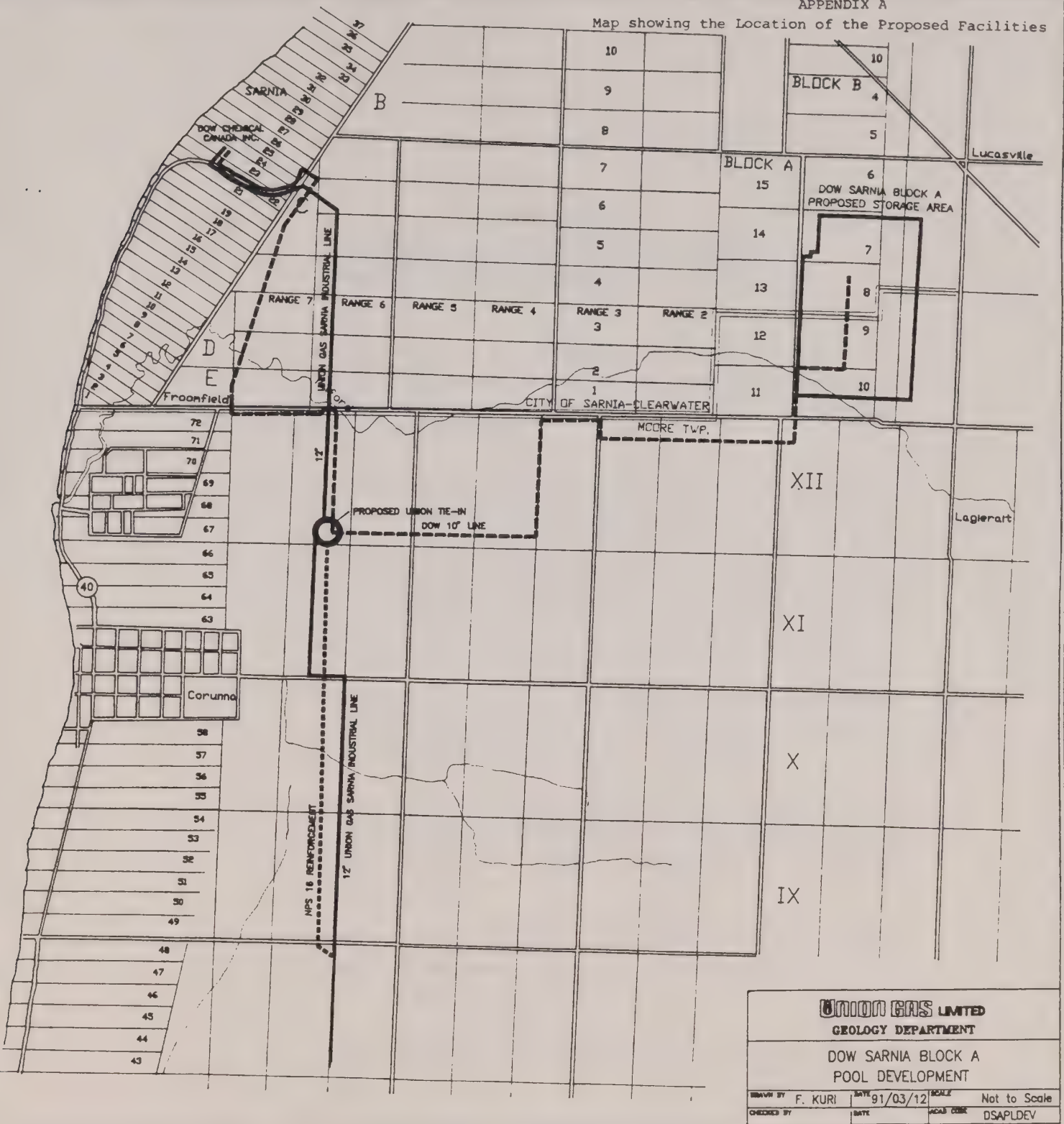
Carl A. Wolf Jr.
Presiding Member



Pamela Chapple
Member

APPENDIX A

Map showing the Location of the Proposed Facilities



UNION GAS LIMITED
GEOLOGY DEPARTMENT

DOW SARNIA BLOCK A
POOL DEVELOPMENT

REVIEW BY	F. KURI	DATE	91/03/12	SCALE	Not to Scale
CHECKED BY		DATE		ACAD CODE	DSAPLDEV

APPENDIX B
Conditions of Approval for Authorization
to Inject, Store and Remove Gas - E.B.O. 172

1. Union shall provide the Board's designated representative with notice identifying and explaining all material gas losses associated with the operation of the Dow Sarnia Block "A" Pool within six months of such losses being identified.
2. Neither Union nor the Joint Venture shall operate the Down Sarnia Block "A" Pool above a pressure representing a pressure gradient of 0.7 psi per foot depth (15.9 kPa/m.) without leave of the Board. Union or the Joint Venture shall support any leave application with an engineering, geological and economic study showing that greater pressures are safe and in the public interest prior to applying to exceed said pressure.
3. Authorization to inject, store and remove gas from the Down Sarnia Block "A" Pool shall expire when Union ceases to be the operator of the Dow Sarnia Block "A" Pool.
4. Union shall make to the owners of any relevant gas or oil rights or of any right to store gas in the Dow "A" Pool area fair, just and equitable compensation in respect of such gas or oil rights or such right to store gas.
5. Union shall make to the landowner and tenants fair, just and equitable compensation for any damage necessarily resulting from the authority hereby being granted by the Board.
6. The Board's designated representative for the purposes of these Conditions of Approval shall be the Board's Project Manager Engineering.

APPENDIX C
Conditions of Approval for Leave to
Construct - E.B.L.O. 239

- (a) Subject to Condition (b), Union shall comply with all undertakings made by its counsel and witnesses, and shall construct the facilities and shall restore the land according to the evidence and submissions of its witnesses and counsel at this hearing.
- (b) Union shall advise the Board's designated representative of any proposed material change in construction or restoration procedures and, except in an emergency, Union shall not make such change without prior approval of the Board's designated representative. In the event of an emergency, the Board's designated representative shall be informed forthwith after the fact.
- (c) Union shall furnish the Board's designated representative with every reasonable facility for ascertaining whether the work has been, and is being, performed in accordance with the Board's Order.
- (d) Union shall file with the Board's designated representative, notice of the date on which the installed pipelines are pressure tested, within one month after the test date.
- (e) Both during and after the construction, Union shall monitor the effects upon the land and the environment, and shall file ten copies of both an interim and a final monitoring report with the Board's designated representative and simultaneously provide a copy of each report to every landowner and tenant on the pipeline routes. The interim monitoring report shall be filed within six months of the in-service date and the final monitoring report shall be filed within 15 months of the in-service date.

- (f) The interim monitoring report shall confirm the Company's adherence to Conditions (a) and (b), and shall include a description of the effects noted during construction and the actions taken or to be taken to prevent or mitigate the long-term effects of the construction upon the land and the environment. This report shall describe any outstanding concerns of the landowners or tenants.
- (g) The final monitoring report shall describe the condition of the rehabilitated right-of-way, and actions taken subsequent to the interim report. The results of the monitoring programs and analyses shall be included and recommendations made as appropriate. Further, the final report shall include a breakdown of external costs incurred to date for the authorized project, with items of cost associated with particular environmental measures delineated and identified as pre-construction related, construction related and restoration related. Any deficiency in compliance with undertakings shall be explained.
- (h) Union shall give the Board's designated representative and the Chairman of the Ontario Pipeline Coordinating Committee ("OPCC") 10 days written notice, of the commencement of the construction of the NPS 16 transmission pipeline, and of the NPS 12, NPS 6 and NPS 4 gathering pipelines.
- (i) Union shall file with the Board's designated representative "as-built" drawings of the pipelines; such drawings shall indicate any changes in route alignment.
- (j) Within 12 months of the in-service date, Union shall file with the Board's designated representative a written Post Construction Financial Report. The Report shall indicate the actual capital costs of the project and shall explain all significant variances from the estimates adduced in the hearing.
- (k) Construction, other than vegetation clearing and construction of valving facilities related to the existing pipeline, shall be undertaken and completed between the months of April through October 1992, inclusive. Authorization for Leave to Construct shall terminate October 31, 1992, unless otherwise ordered by the Board.

- (l) Union shall designate one of its employees as its project manager who will be responsible for the fulfilment of conditions and undertakings on the construction sites, and shall provide the name of the project manager to the Board's designated representative. Union shall prepare a list of the conditions imposed by the Board, and the undertakings given by its counsel and witnesses during the hearing and will provide it to the Board's designated representative for verification and to the project manager for compliance during construction.
- (m) Where buildings or structures exist within 200 metres of the pipelines and blasting is necessary, Union shall:
 - i) use restricted blasting techniques by ensuring that all charged areas are covered with blasting mats to eliminate fly rock;
 - ii) have the vibrations from blasting operations monitored and measured by a vibration measurement specialist;
 - iii) notify all property owners within 200 metres of the easement of the proposed blasting in writing one week prior to the blasting and confirmation (if necessary) of the actual day or days on which blasting will occur; and
 - iv) have buildings within 200 metres of the easement inspected by an independent examiner before and after operations to identify problem areas.
- (n) Where blasting is required, the well condition and water quality of all wells within 30 metres of the pipelines shall be tested before and after blasting operations.
- (o) Construction of the NPS 16 pipeline shall not commence until Union has reached agreement with Ontario Hydro regarding the necessary land rights.
- (p) Union shall undertake to take such mitigation measures as may be necessary if the noise emitted from the compressor station does not meet the statutory environmental sound guidelines in Ontario. Union will take into consideration the concerns and suggestions

of the neighbouring tenants and the landowner when determining what, if any, mitigation measures to take.

- (q) In accordance with the communication procedure approved by the Board as Condition (n) of its E.B.L.O. 234 Phase I Decision with Reasons, Union shall reasonably guarantee that landowners and tenants will have rapid access to a senior manager at all times when there is a dispute over the construction decisions of Union's field representatives. A clear written description of the procedure, including contact names and the steps to be taken shall be approved by the Board's designated representative and provided to all affected landowners and tenants prior to commencing construction of the pipeline.
- (r) Union shall append to its interim and final monitoring reports a log of all landowner and tenant complaints that have been received during construction. Such logs shall record the times of all complaint-related communications between Union and the landowners or tenants; the substance of each complaint; the actions taken in response; and the reasons underlying such actions.
- (s) The Board's designated representative for the purposes of these Conditions of Approval shall be the Board's Project Manager, Engineering.

